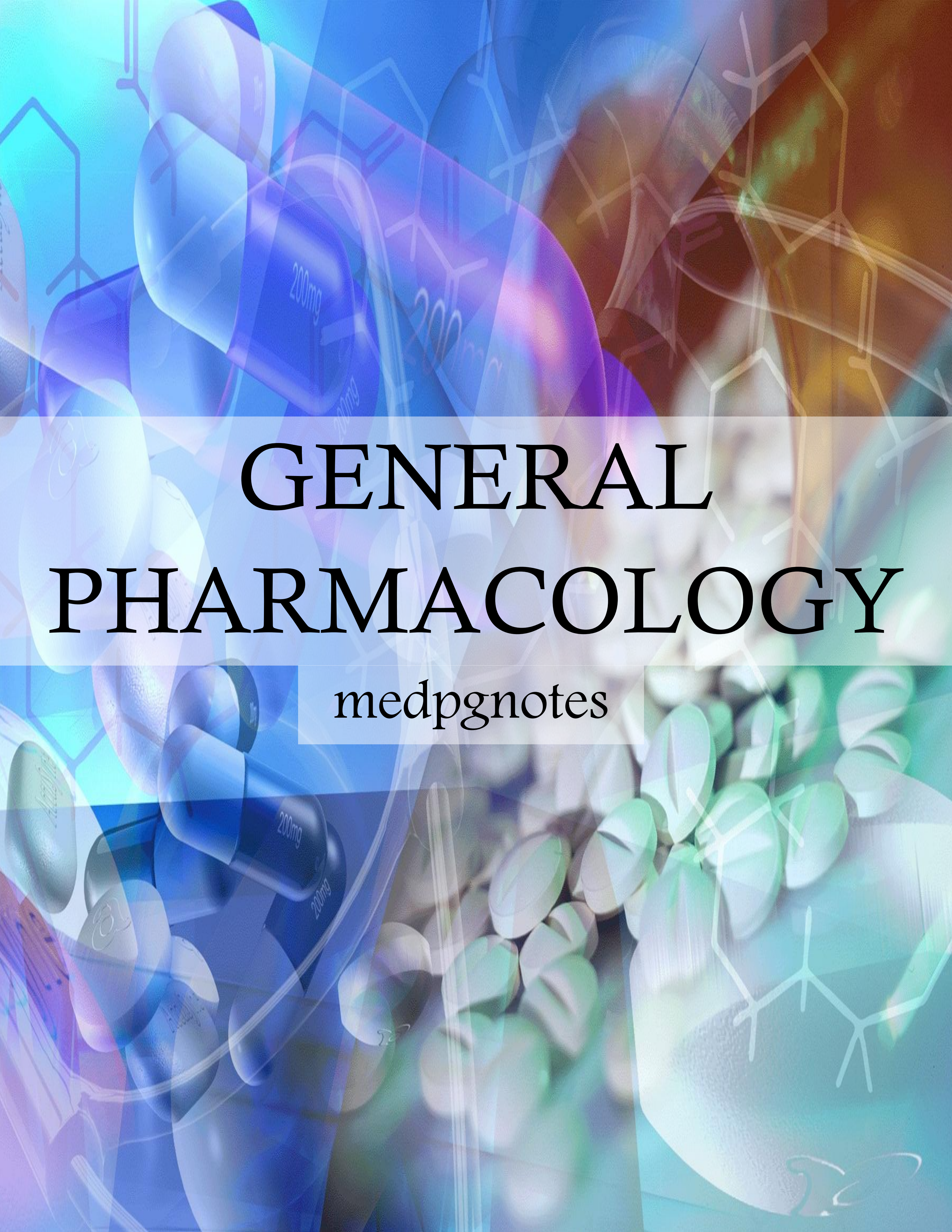

GENERAL PHARMACOLOGY

medpgnotes

GENERAL PHARMACOLOGY

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KEY TO THIS DOCUMENT

Text in normal font – Must read point. Asked in any previous medical entrance examinations

Text in bold font – Point from Harrison's text book of internal medicine 18th edition

Text in italic font – Can be read if you are thorough with above two.

INTRODUCTION TO PHARMACOLOGY

GENERAL FEATURES OF PHARMACOLOGY

Mechanism of action	Pharmacodynamics
Pharmacovigilance means	Monitoring of drug safety
ED50 corresponds to	Potency
Reasons for alteration of drug dosage in elderly	Decreased renal function, Lean and body mass is less, Decreased baroreceptor sensitivity, Body water decreased
NOT a cause of toxicity due to drug in elderly	Decreased volume of distribution
Both barbiturates and salicylates are maximally absorbed in stomach	They are weakly acidic and do not ionize in stomach
Removal of acidic drugs in body done by	Sodium bicarbonate
Alkalinization of urine is done for	Weak acid drug
Drugs used for rare disease	Orphan drugs
Therapeutic window phenomenon	Carbamazepine
Therapeutic window	Clonidine, Imipramine, Glipizide
Therapeutic window phenomenon NOT seen in	Furosemide
Cross plasma membrane	Thyroxine, Androstendione, Estrogen
Does NOT cross plasma membrane	Epinephrine
Wrong in prescription	Dose in mg/kg
Prescription drugs included in	Schedule H of drugs and schedule C of drugs and cosmetic act
Efficacy and potency	Efficacy is more important, in log dose response curve height of curve is efficacy, drug producing similar pharmacological response have different levels of efficacy
When a drug is evaluated for its usefulness in controlled conditions. it is termed as trial signifying	Efficacy
Property of drug will enable it to be used in low concentrations	High stability
A shift to right in biological activity dose response curve for a hormone without accompanying change in maximal response indicates	*Decrease in sensitivity*
Drug metabolized by cholinesterase	Succinylcholine, mivacurium
Drugs undergoing enterohepatic circulation	*Erythromycin, ampicillin, rifampicin, tetracycline, oral contraceptives, phenolphthalein*
Given under supervised regimen in India	Clofazimine, pyrazinamide, rifampicin
Banned by International Olympics Committee are	Salbutamol, spironolactone, erythropoietin
Counterirritants allay pain by	Inhibiting pain pathway at dorsal horn gate

CLINICAL TRIALS

Phase I	Normal Healthy Volunteers, CANNOT Determine efficacy
Healthy normal human volunteers participate in	Phase I
Maximum tolerated dose of a new drug is evaluated in	Phase 1
To determine dose level at which signs of toxicity occurs	*Phase I*
Phase 2 clinical trials to	Determine efficacy
Phase II is to assess	Therapeutic efficacy
Trial to demonstrate one drug is better than other	Phase II
Marketing of drug	Phase III
Efficacy of a new drug A is compared with existing drug B	Clinical trial phase III
New Drug Application is filed after	Phase III
Ethical clearance NOT required in	Phase IV
Post marketing surveillance	Phase IV
Aim of post marketing studies	Safety and comparison with other medicine
Good clinical practice NOT seen in	Preclinical trials
Pre post clinical trial	They use the patient as his or her own control
In drug design, concern is for	Increasing frequency of drug and target interaction

METABOLISM OF DRUGS

Detoxification of drugs is controlled by	Cytochrome P450
Main enzyme responsible for activation of xenobiotics	Cytochrome p450
Cytochrome playing major role in drug metabolism	Cytochrome P450
Cytochrome P450 commonly involved in drug metabolism	CYP3A4
Metabolic activation of Procarcinogen done by	Cytochrome P450
Cytochrome involved in monoxygenase mediated detoxification of drug	CYP450
Associated with endoplasmic reticulum	Cytochrome P450
In drug metabolism, hepatic cytochrome P450 system is responsible for	Phase I reaction only
Cytochrome P450 is present in	Placenta, Liver, Testis, Adrenal Cortex
P in cytochrome P450	Pigment
Features of cytochrome P450	*All in hemoproteins, exhibit genetic polymorphism, involved in metabolism of xenobiotics and also in metabolism of endogenous compounds*
CYP450 inducers	Phenobarbitone, DDT
Most abundant hepatic and intestinal CYP	**CYP3A4**
Second most common CYP	**CYP2D6**
CYP34A enzymes affected by	Phenytoin, Carbamazepine
CYP2D6 associated with	**Codeine, tamoxifen, TCA**
CYP2D6 inhibitors	**Fluoxetine, Quinidine**
NOT useful in detoxification of drugs	Cytochrome oxidase

Phase I reaction	Conjugation
Phase I reaction	Hydroxylation
NOT a phase I reaction	Conjugation
NOT a oxidative type of drug metabolism	Glucoronidation
Phase II reactions in hepatic metabolism	Sulfation, Methylation, Glucoronidation
NOT a metabolism involved in xenobiotics	Methylation
NOT a synthetic reaction of drug metabolism	*Cyclization*
Non synthetic phase I reaction during drug conjugation	Oxidation
Addition of Hydrogen	Reduction
Metabolized by acetylation	Sulfonamide, Hydralazine, Isoniazid, Procainamide
Acetylation	INH, Hydralazine, Procainamide
Sulfonamide is conjugated with	Acetylation
Fast acetylation leads to	Higher blood levels of the toxic metabolite acetylisoniazid and thus to an increase in toxic reactions, hepatitis which is 250 times more common than in slow acetylators
Which is metabolized like xenobiotics	Bilirubin
Bile salts undergo xenobiotics	After conjugation with beta glucoronic acid

KINETICS

Pharmacokinetics	Study of absorption, distribution, binding storage or biotransformation and excretion of drug
Pharmacokinetic change occurring in geriatric patients is decline in	Renal clearance
Zero order kinetics	A constant amount of drug is eliminated per unit time
Zero order kinetics in high dose of	Phenytoin and propanolol
Zero order kinetics	Phenytoin, Alcohol, Theophylline
At toxic doses, zero order kinetics seen in	Phenytoin
Zero order kinetics	High dose salicylates, Phenytoin, Ethanol
Elimination of alcohol follows	Zero order kinetics
Pseudo zero order kinetics	Warfarin, phenytoin, alcohol, aspirin, theophylline, tolbutamide
First order kinetics	Constant proportion of plasma concentration is eliminated per unit time
First Order Kinetics	Rate of Elimination is proportional to plasma concentration of the drug
First order kinetics	Clearance remains constant
For drugs with first order kinetics the time required to achieve steady state levels can be predicted from	Half life
Examples of nonlinear kinetics	Biliary excretion of isotretinoin, Glomerular filtration of naproxen, GI transport of penicillin
NOT a nonlinear kinetics	Metabolism of amikacin
Inter dose interval depends on	Half life of drug
Time required to reach steady state after a dosage regimen depends on	Half life of a drug
Elimination after 4 half lives in first order kinetic is	93.75%
Amount of drug left after 4 half lives	6.25%

If half life of drug is increased from 6 hours to 8 hours, then dose of drug is to be increased from 300 mg to	500 mg
Property of a drug that will enable it to be used in lower concentration	High affinity
Side effects of drug minimized by	High specificity
pH at which drug in 50% ionized	pKa
Ionization of drug is dependent on	pKa and pH
Knowledge of pka of drug is useful in	Predicting drug's behavior in various body fluids
NOT true	Small changes of pH near pKa of a weak acidic drug will not affect its degree of ionization

ENZYME INDUCERS AND INHIBITORS

Enzyme inducers	Griseofulvin, phenytoin, rifampicin, smoking, carbamazepine, phenobarbitone
Potent microsomal enzyme inducer	Rifampicin
Microsomal enzyme inducer	Phenobarbitone
Cytochrome P450 inducing anti retroviral drug	*Nevirapine*
Cytochrome p450 inducing antiplatelet	*Clopidogrel*
Does NOT induce microsomal enzymes	Cimetidine
Enzyme inhibitors	Valproate, isoniazid, ketoconazole, cimetidine, ciprofloxacin, quinolones, chloramphenicol, metronidazole, streptogramin, macrolides except azithromycin, azoles except fluconazole
Enzyme inhibitor	Cimetidine
Inhibitor of cytochrome p450	Ketoconazole
Potent microsomal enzyme inhibitor	Sodium valproate
Inhibitor of microsomal enzymes	Ketoconazole
Microsomal enzyme marker	Glucose 6 phosphatase
When carbamazepine is administered one should avoid	Erythromycin
If theophylline used with ciprofloxacin	Toxicity of theophylline increased

DRUG DISTRIBUTION AND CLEARANCE

Volume of distribution	Dose administered / plasma concentration
Apparent volume of distribution of a drug exceeds total body fluid volume, if a drug	Sequestrated in body tissues
Drugs with high plasma protein binding	Lower volume of distribution
Drug distribution is influenced by	Plasma protein binding, Lipid solubility, Degree of blood flow, Age
Volume of distribution of drugs is altered in	Obesity, Pregnancy, Older age, Neonate
Volume of distribution of the drug is much more than total body water	Propanolol
Loading dose of a drug depends primarily on	Volume of distribution
Loading dose of a drug is given to	Achieve high concentration in short time
Loading dose does NOT depends on	Clearance of drug
Clearance	Refers to efficacy of elimination of a drug by an organ

	or whole body, Cannot be greater than blood flow to an organ, Determines the steady state of drug concentration
Clearance of a drug means	Unit volume of plasma which is cleared in unit of time
Ability of body to eliminate any drug is called	Clearance
Renal clearance	uv/p
Clearance	0.693 * Vd/t ½
Substance is reabsorbed in tubules, its clearance	Less than Inulin
Least clearance	Glucose

ROUTE OF ADMINISTRATION

Route of administration	IM administration needs sterile technique
Duration of action of iv administered drug depends on	Protein binding, Clearance, Distribution volume, Lipid solubility, Half life
After IV administration, elimination of drug depends on	Lipid solubility, Volume of distribution, Clearance, Drug concentration
NOT true	Total body stores will always be higher if the drug is given by intravenous infusion
Given by IV route	Heparin, Pantoprazole, Ranitidine
Intradermally	Test dose of drugs, BCG vaccine, Mantoux test
Advantages of sublingual injection	Easy to administer, prevents first pass metabolism, can be spited out with signs of toxicity
Alternative routes of administration rectal, buccal, transdermal etc present in	Fentanyl
Drug that can be given intravenously, epidurally, transdermally	Fentanyl
Drug that can be given oral, iv, im, epidural, sc	Diazepam

THERAPEUTIC INDEX

Therapeutic index	Margin of safety
Ratio of median lethal dose to median therapeutic dose	Therapeutic index
Ratio of dose that produces toxicity to the dose that produces a clinically desired or effective response in a population of individual	Therapeutic index
Therapeutic index	LD50/ED50
Therapeutic index is a measure of	Safety
Narrow therapeutic index	Lithium, Phenytoin, TCA
Narrow therapeutic range	Phenytoin, Theophylline
For therapeutic drug monitoring to be clinically useful	There should be a good relationship between plasma concentration and drug dosage
Plasma drug monitoring is done for	Drug with low safety margin
Therapeutic monitoring	Digoxin, Lithium, Phenytoin
Therapeutic drug monitoring NOT required for	Metformin
Dose monitoring is NOT needed in	L-dopa
Routine monitoring of plasma concentration is NOT required in	When pharmacodynamic tolearance to a drug is known to occur

ED50 is useful for determining	Potency

PRODRUG

Precursor of active drug	Prodrug
Prodrug	Levodopa
Prodrug	Sulphasalazine, Cyclophosphamide
Prodrug	Enalapril
Prodrug	Oxcabazepine, Chloralhydrate
Prodrug	Mercaptopurine, Dipivefrine
Prodrug	Enalapril, Levodopa, Sulfasalazine, Bacampicillin, Ticlopidine, Clopidogrel, Omeprazole, Oxcarbazepine, Chloral hydrate
Prodrug	*Prasugrel, methyldopa, salmeterol, bambeterol, minoxidil, carbimazole, terfenatidine, loratidine, loperamide, acetyl salicylate, Dihydropyridine, Pralidoxime, Fosphenytoin, Chloramphenicol Succinate, Acyclovir, 5-Fluorouracil, Diethylstilbestrol diphosphate, 6-Mercaptopurine, Mitomycin C, Zidovudine, Carisopodol, Heroin, Molsidomine, Phenacetin, Primidone, Psilocybin, Sulindac, artesunate*
Antiplatelet prodrug	Clopidogrel
Famciclovir is the prodrug of	Penciciclovir
Flurazepam	**Prodrug**
Does NOT have active metabolite	Lisinopril
NOT a prodrug	Ticagrelor

BIOAVAILABILITY AND FIRST PASS METABOLISM

Bioavailability of drug	Proportion of unchanged drug reaching systemic circulation, bioavailability of orally administered drug can be calculated by comparing area under curve (0-alpha) after oral and intravenous administration, bioavailability can be determined from plasma concentration or urinary excretion data
Bioavailability	The percentage of drug that is detected in systemic circulation after its administration
Bioavailability	Good protein binding increases volume of distribution
Bioavailability of drug is increased by	*Suspension form*
Least oral bioavailability	d-tubocurarine
Causes for reduced bioavailability	High first pass metabolism
NOT true	Low oral availability always and necessarily mean poor absorption

High first pass effect	Verapamil
First pass effect seen in	Oral
High first pass metabolism	Lignocaine, Propanolol, Salbutamol
Very high first pass metabolism	Propanolol
High first pass metabolism	Pethidine, amitryptyline, salbutamol
Drugs with high first pass metabolism	*Isoprenaline, glyceryl trinitrate, pethidine, lignocaine, testosterone, hydrocortisone, verapamil,morphine, salbutamol*
Avoid first pass metabolism	Intraarterial injection
First pass metabolism NOT seen in	Insulin
Time for peak plasma concentration	Rate of absorption
Methods to delay drug absorption	Sustained release preparation, Oily suspension for intramuscular injection, Incorporating adrenaline with the drug for subcutaneous injection

AGONIST, ANTAGONIST AND INVERSE AGONIST

Agonist is having	Affinity with intrinsic activity 1
Inverse agonist	It is easier to observe inverse agonism if there is sufficient constitutive activity of receptor in absence of agonist
Inverse agonist	Binds to receptor and cause opposite action
Inverse agonist	Famotidine and losartan
Inverse agonist	Higher affinity for INACTIVE form
Receptor action of a drug	An antagonist has affinity but no intrinsic activity
When two chemicals act on two different receptors and their response is opposite to each other on same cell	Physiological antagonism
Physiological antagonism	Adrenaline and histamine, Salbutamol and leukotriene, Prostacyclin and thromboxane
Antagonism between acetylcholine and atropine	Competitive antagonism
Chemical antagonism	Heparin and protamine

EXCRETION OF DRUG

Primary site of absorption of oral drug	*Upper portion of small intestine*
High hepatic extraction ratio is seen in	Propanolol, Lidocaine, Imipramine, Theophylline
Dose adjustment needed in liver disease	Methotrexate, Rifampicin, Tolcapone
Drug NOT given in hepatic failure	Diazepam
Does NOT undergo hepatic metabolism	Penicillin G
Highly ionized drug	Excreted mainly by kidneys
Drug NOT given in renal failure	Amphotericin B, NSAID, Amikacin, Ethambutol
Secreted in breast milk	Antihistaminics, Antihyroid drugs, Penicillin, Diazepam, Antiepileptics
Excreted in saliva	Lithium

DRUG BINDING

True statements	Acidic drugs bind to albumin in plasma, Basic drugs bind to alpha 1 acidic glycoprotein, Drugs having higher affinity can displace other from same protein
Bound to alpha 1 acid glycoprotein	Procainamide, Disopyramide, Quinidine
Drug binding to albumin	Penicillin
Drug with highest plasma protein binding	*Diazepam*
Binds maximally with thyroid hormones	*Albumin*
As the concentration of drug increases over the therapeutic range, bound form of the drug	Increases

TRANSPORT OF DRUG

Drug transport mechanisms	Active transport, Passive transport

PHARMACOGENETICS

Variation in drug response due to genetic differences	Pharmacogenetics
Pharmacogenetics associated with	Variability of enzyme action, Individual variability in oral absorption, Different DRC in different individuals
Pharmacogenetic conditions	Malignant hyperthermia, coumarin insensitivity, G6PD deficiency
Pharmacogenetics is important in metabolism of	*Isoniazid*
NOT a pharmacogenetic condition	Adenosine deaminase deficiency

DRUG AND FOOD

Food increases bioavailability of	*All statins except pravastatin, fibrates, halofantrine, erlotinib, phenytoin, nelfinavir, hydrochlorthizide*
Drug absorption increase when taken with food	Halofantrine
Drug absorption decreased when taken with food	Digoxin
Food does NOT interfere in absorption on	Cimetidine

IMMUNOMODULATORS

GENERAL FEATURES OF IMMUNOMODULATORS

Nucleotide derivative of therapeutic importance in	Azathioprine

renal transplant	
Side effect of azathioprine	**Bone marrow suppression**
Antitumor agent works by impairing de novo purine synthesis	Methotrexate
Dihydrofolate reducatse inhibitor	Methotrexate
Triple therapy immunosuppressants for post renal transplant patients	Cyclosporine, azathioprine, prednisolone
Most widely used interferon	IFN alpha 2b
NOT an immunosuppressive drug	Cefaclor
NOT an immunosuppressant	Cephalosporin
Immunosuppressant agents may cause	**Non Hodgkin's lymphoma**
Palifermin	*Keratinocyte growth factor*
Abatacept	*Fusion protein*

CYCLOSPORINE AND TACROLIMUS

Drugs inhibiting IL2	Cyclosporine, Tacrolimus
Cyclosporine A acts on	CD4 cells and lymphocytes
Act through helper T cells	Cyclosporine
Cyclosporine inhibits	T lymphocyte proliferation, IL 2
Immunosuppressive agents acts selectively by inhibiting helper T cells	Cyclosporine
NOT true about cyclosporine A	Given orally as toxic to as intravenous
Adverse effects of cyclosporine	Hyperkalemia, Hypertension, Nephrotoxicity, Hirsutism
NOT a side effect of cyclosporine	Bone marrow suppression
Calcineurin acts via	Inhibiting calcium channels via depolarisation
Calcineurin activated by calmodulin via	Dephosphorylation
Tacrolimus is isolated from	**Streptomyces tsukubaemis**
Tacrolimus	Inhibits Calcineurin pathway
Tacrolimus acts by inhibiting	T cell proliferation
Side effect of tacrolimus	*Glucose intolerance*
FK 506	Macrolide antibiotic
Tacrolimus	Macrolide, prophylaxis of organ transplant rejection, glucose tolerance is a side effect
Antibiotic NOT given in patient with tacrolimus	Rifampicin
Tacrolimus level NOT increased in	Rifampicin
Tacrolimus toxicity precipitated by	Gentamycin, cisplatin, vancomycin
Side effect of tacrolimus	Nephrotoxicity, neurotoxicity, hepatotoxicity
Nephrotoxicity is a side effect of	Tacrolimus
NOT true about tacrolimus	Ototoxic, Hirsutism
Sirolimus	Block kinase in IL2 receptor pathway
Sirolimus arrest cell cycle at	**G1**
Sirolimus acts by inhibiting	IL 2
Side effects of sirolimus (rapamycin)	**Hyperlipidemia, thrombocytopenia**
Rapamycin induces	**Autophagy**

LEVAMIZOLE

Antihelminthic also acting as immunomodulator	Levamisole
Levamizole	Immunostimulator, Immunodepressor in high doses, PROLONGED treatment helpful in psoriasis, Acts as antihelminthic by causing depolarization

MYCOPHENOLATE MOFETIL

Mycophenolate mofetil	Used in transplant rejection, prodrug and converted to mycophenolic acid, Not used with azathioprine
Mycophenolate mofetil	Prodrug, selective uncompetitive reversible inhibitor, selectively inhibit lymphocyte proliferation
Mycophenolate acts by inhibiting	IMP dehydrogenase
Side effects of mycophenolate	**Diarrhea, cramps**
NOT true about mycophenolate mofetil	Nephrotoxic
NOT true about Mycophenolate mofetil	Inhibits calcineurin

IMIQUMOD

Imiquimod	INDIRECT antiviral activity, Antitumor activity, Releases cytokines
Imiquimod is used in treatment of	*Molluscum contagiosum, warts, skin cancer*
Topical immunomodulator used in treatment of genital warts	Imiquomod
Imiquimod used in anogenital warts is mainly	Immunostimulator

THALIDOMIDE

Thalidomide	Reintroduced for its activity in ENL, developed as antiemetic in pregnancy but withdrawn because of phocomelia, used for new and relapsed case of multiple myeloma
Most teratogenic drug	Thalidomide
Thalidomide has	Anti angiogenic action
Thalidomide can be used in	ENL
Thalidomide used in multiple myeloma	Associated with peripheral neuropathy, Characterized by enatiomeric interconversion
Thalidomide NOT used in	HIV associated peripheral neuropathy
Phocomelia associated with	Thalidomide
Lenolidomide cause thromboembolism when given with	Dexamethasone
NOT a side effect of thalidomide	Diarrhea
NOT true about thalidomide	Cause euphoria and diarrhea

ANTI TNF ALPHA DRUGS

Sources of TNF	Neutrophil, Macrophage, Basophils, B cells
TNF blockers	Adalimumab, Etenercept, Infliximab
TNF alpha blockers are contraindicated in	**Congestive heart failure**
TNF alpha inhibitors should NOT be used in	Rheumatoid arthritis with hepatitis B
Anti TNF alpha drugs NOT used in treatment of	SLE
Anti TNF NOT used with	RA with hepatitis B
Infliximab directed against	TNF alpha
Infliximab is contraindicated in	*SLE*
Eternacept	Blocking tumor necrosis factor
Etenercept used in rheumatoid arthritis act by inhibition of	TNF alpha

MONOCLONAL ANTIBODIES

Use of monoclonal antibodies	Immunotherapy, Immunological identification of cells and tissues, Radioimmunoimaging
Infliximab	IgG1 chimeric monoclonal antibody against TNF alpha
Monoclonal antibody to IL-5	Mepolizumab
Fully humanized antibodies used in treatment of rheumatoid arthritis	Adalimumab
Only FDA approved radioactive antibody used in treatment of lymphoma	Rituximab
Bevacizumab is used in	Diabetic retinopathy
Monoclonal antibody against VEGF	Bevacicumab
Donesumab, a monoclonal antibody against RANK ligand used in treatment of	Osteoporosis
EDFR antagonist used in palliation in head and neck cancer	Cetuximab
Monoclonal antibody against CD20b lymphocyte	Rituximab
Panizumumab	**Colon cancer**
Almetuzumab (CD52)	**CLL**
Bertezomib	**Multiple myeloma (target is proteosome)**
Gefliritinib	**Non small cell lung cancer**
Erlotinib	**Small cell lung cancer and ca pancreas**
Sorafenib	**RCC, HCC**
Side effect of sorafenib	**Hand foot mouth syndrome**
Tyrosine kinase inhibitor targeting her 2 kinase	**Lapatinib**

AUTACOIDS

GENERAL FEATURES OF AUTACOIDS

Prostaglandins and leukotrienes are released from	Arachidonic acid
Lipoxin belong to	Arachidonic acid metabolites
PGF2 alpha TXA2	Vasoconstriction
Vasoconstriction caused by	TXA2 and PGF2
Inhibitor of Lipoxygenase pathway	Benoxaprofen

NSAIDS

NSAID undergoing enterohepatic circulation	Piroxicam
Care in use if NSAID in old age	Renal
Drug having covalent interaction with target	Aspirin
Suicidal enzyme	Cyclooxygenase
COX 1	Mainly involved in protection of gastric ulcer
House keeping	COX 1
Inducible enzyme	COX 2
COX 2	Constitutionally expressed on some cell surfaces, Induced at the site of inflammation, Utilized in generation of eicosanoids with a ring structure
COX-2 implicated in	Cell migration
COX 2 modulate	Cell proliferation
NOT a product of cycloxygenase pathway	LT6
Cyclooxygenase inhibited by	Warfarin
COX pathway is inhibited by	Aspirin, Indomethacin, Diclofenac, rofecoxib
Irreversible COX inhibitor	Aspirin
Non selective COX inhibitor	Tenoxicam, Meloxicam
Cox inhibitors protect	**Carcinoma colon**
Most aptly characterizes ibuprofen vis-à-vis other NSAIDs	Like other NSAIDs it can cause aseptic meningitis
Ibuprofen acts on	Cycloxygenase pathway
NSAID having good tissue penetrability with concentration in synovial fluid	Diclofenac sodium
Topical NSAID used for ophthalmic use	*Nepafenac*
NSAID do not act by inhibiting prostaglandin synthesis	Nefopam
Non opioid analgesic and does NOT inhibit prostaglandin synthesis	Nefopam
Pain control in a patient with history of GI bleeding	Rofecoxib
Rofecoxib withdrawn due to	Ischemic heart disease
Chemically paracetamol is	N acetyl p aminophenol
NSAID least cox 1 & selective cox 2 activity like celecoxib	Diclofenac
Aspirin	Acetyl salicylic acid
Inhibits an enzyme in prostaglandin secretion	Aspirin
Aspirin inhibits	Cycloxygenase I and II irreversibly

MAO of aspirin	Irreversible inhibition of COX enzyme
Having covalent interaction with target	Aspirin
NOT true about NSAID	Duration of action of aspirin is primarily related to pharmacokinetic clearance of drug from body
Low dose of aspirin advised in	IUGR, Post myocardial infarction, Pre eclampsia
Therapeutic effect of antihypertensive drugs is blunted by NSAIDs because they	Decrease the synthesis of vascular prostacyclin
Aspirin is used with caution in	Gout because it can increase serum uric acid
A patient on aspirin will have increase in	Bleeding time
Aspirin toxicity	Tinnitus is an early symptom, 10 – 30 gram causes poisoning
Long term use of aspirin in children is associated with	Reye syndrome

PROSTAGLANDINS

Acyclic fatty acid derivatives	Prostaglandins
Prostaglandins	*Resyntheized from membrane lipids*
Large amounts of prostaglandins are present in	*Seminal fluid*
PGE2,PGI2	Vasodilatation
Prostaglandin E1 and E2	Vasodilatation
Arteriolar smooth muscle relaxed by	PGE2 and PGI2
PGE2	*Dinoprostone, enprostil, rioprostil*
PGE2	Bronchodilator
Bronchodilator	PGE2
Prostaglandin helpful in cervical ripening	PGE2
Prostaglandin helpful in protecting gastric mucosa	*PGE2*
Prostaglandin in hypothalamus associated with fever	**PGE2**
PGE2 is more in	**Circumventricular organ**
Latanaprost	*PGF2 alpha*
Bronchoconstrictor	PGF2 alpha
Oxytocic action	PGF2 alpha
PGE1 PGI2	Inhibit platelet aggregation
Platelet aggregation inhibited by	PGE2 and PGI2
Misoprostol	Prostaglandin E1 analogue
Prostanoids are used for	Glaucoma, Platelet coagulation disorders, Gastric ulcer, Maintenance of PDA before surgery
PGE1 used in	MTP, Impotence, Maintenance of PDA
PGI2 analogue	*Epoprostenol, treprostinil, bevaprost, ilioprost*
Prostaglandin analogue used in glaucoma	Latanoprost
Prostaglandin inhibiting action of ASPIRIN NOT useful in	Uricosuria
Use of prostaglandin in pregnancy cause	Fever, Vomiting, Uterine rupture
Prostaglandin NOT used in	Palliative treatment of PDA

LEUKOTRIENES

Leukotrienes are secreted by	T4,T8 cells, macrophages
SRS A is a	Leukotriene
Chemotactic factor	Leukotriene
Secondary mediator of anaphylaxis	Leukotriene B4
Leukotrienes cause	Smooth muscle constriction
Leukotrienes helping in leucocyte adhesion	LTB4
Which leukotriene is an adhesion factor for neutrophil on cell surface	*B4*
Zafirlukast	Leukotriene receptor blockage
Leukotriene receptor antagonist	Zafirlukast

THROMBOXANE

Platelet aggregation and vasoconstriction	Thromboxane A2
Platelet aggregation facilitated by	TXA2
TXA2	Formed in platelets, Formed in PGG1/H2, Prothrombotic, Aspirin can inhibit its production

ANTIHISTAMINIC DRUGS

NOT a function of H1 antagonist	Decreases gastric secretion
H3 receptor agonist can cause	Inhibition of H1 receptor induced wakefulness, inhibition of H1 mediated bronchoconstriction, negative chronotropic effect on atria
Anti histaminic with high anti cholinergic action	*Promethazine*
Drug on H1 with no active metabolite	*Mizolatine*
Long acting classical H1 antihistaminic include	Chlorpheniramine
Non sedative antihistaminics	Fexofenadine, Levocetizine, Desloratidine
Non sedative antihistamine	Cetrizine
Best topical action	Azelastine
Least CNS depression	Loratidine
Does NOT have interaction with macrolides and anti fungal	*Loratidine*
NOT metabolized	Cetrizine
Second generation antihistaminics used in allergic rhinitis	Azelastine, Fexofenadine, Desloratidine
NOT a second generation antihistamine	Cyclizine
Drug having active metabolite	Fexofenadine
Does NOT cause blood brain barrier	*Fexofenadine*
Fexofenadine is metabolic product of	Terfenadine
Cetrizine class II is a derivative of	Hydroxyzine
Longest acting antihistamine	Astemisole
Histamine blocker in stomach act through	Decreasing IP3 in stomach

Most rapid action	Terfenadine
Antihistaminic NOT crossing BBB	Terfenadine
Antihistamine used in motion sickness	Diphenhydramine
Multiple itchy erythematous wheals all over body. no respiratory difficulty	Antihistamines
Which drug when given with terfenadine can cause ventricular arrhythmia	Ketoconazole
Treatment of antihistamine poisoning	**Physostigmine (contraindicated in asthma)**

DRUGS ACTING ON 5HT

NOT a 5HT receptor antagonist	Lanreotide
Sumatriptan	Selective 5HT1B/1D agonist
Ketanserin	5HT2 antagonist
Aripiprazole	5HT2 receptor antagonist
Nefazodone	*5HT2 antagonist*
Ondansteron	Potent antiemetic
Most potent 5HT3 blocker	*Palonosetron*
May prolong QT interval	*Dolosetron*
NOT an antiemetic	Phenazocine
NK1 receptor antagonist	Aprepitant
Aprepitant	Crosses blood brain barrier, metabolized by CYP3A4 pathway, ameliorates nausea and vomiting of chemotherapy
Tegaserod is newer	Laxative
Tegaserod is	*5HT4 agonist*
Metaclopramide used for	GERD, Vomiting, Emergency GA

COLCHICINE

Mechanism of action of colchicines	Suppresses immunity
Mitosis arrest in Metaphase	Colchicines
Colchicine is used in	Amyloidosis, Cirrhosis of liver, Familial Mediterranean fever
MC side effect of colchicines which is dose limiting	Diarrhea

ADVERSE REACTIONS

Undesirable and unavoidable pharmacodynamic effects of a drug	Side effect
Type A adverse reaction	Predictable from drug's known pharmacological effects, Common, Dose dependent
NOT a type A (augmented) adverse drug reactions	Qualitative abnormal responses to the drug
Idiosyncracy	Genetically determined abnormal reaction
NOT a dose related relation	Drug fever of Sulpha
Drugs causing metallic taste	Antimicrobials, Anticancer drugs, Gold

Sedation as a side effect	Antihistaminics and antidepressants
Side effect of ketotifen	Drowsiness
Histamine producing drug	Corticosteroids, Phenytoin, Minoxidil
NOT a histamine producing drug	Methyldopa
Mucositis is caused by	5-FU, Methotrexate, Paclitaxel, Etoposide
Sclerosing skin changes	Adriamycin, Bleomycin, Busulfan
Side effect of amantidine	Ankle edema
Hepatotoxic drugs	Erythromycin estolate, Rifampicin, Tetracycline
Hepatotoxic drugs	Chloroform, Halothane
Pseudojaundice caused by	Rifabutin
Pseudolymphoma	Phenytoin, Diphenhydramine, Procainamide
Drugs causing fetal renal abnormalities	ACE inhibitors, ARB
Hypertension NOT seen with	l-dopa
Coronary steal phenomenon seen in	Dipyridamole
Pulmonary fibrosis associated with	Amiodarone
Pulmonary fibrosis	Bleomycin, Busulfan, Nitrofurantoin
Antimalignant drug need NOT to be metabolized for its action	Busulfan
Bone marrow aplasia	Chloramphenicol, Alpha methyl hydantoin, Chlorpromazine
Appearance of markedly vacuolated nucleated red cells in marrow, anemia and reticulocytopenia are characteristic dose dependent side effects of	Chloramphenicol
NOT true about bone marrow aplasia	Methicillin
Nasal bone dysplasia is associated with	Warfarin
Hyperpyrexia is caused by	MAO inhibitors, Atropine , Amphetamine
Does NOT cause hyperpyrexia	Alcohol
Drugs causing curare like side effects	Polymyxin, Tetracycline, Streptomycin
Drug producing neutrophilia	Glucocorticoids
Methemoglobinemia by	Procaine,prilocaine,nitroglycerine
Causes of methemoglobinemia	Nitrites, Phenacetin, Sulfonamide
Drugs causing methemoglobinemia	Aniline, Dapsone, Nitrates
NOT a cause of methemoglobinemia	Phenytoin
Methemoglobinemia corresponds to visible spectrum	Blue
Treatment of methemoglobinemia	**IV methylene blue**
Discolouration of urine	Rifampicin, Riboflavin
Does NOT cause discolouration of urine	Digoxin
Teratogen causing deafness	Isotretinoin
Teratogenicity of furosemide	*PDA*
Teratogenicity of SSRI	*Pulmonary hypertension*
Side effects of dapsone	Hemolytic anemia, Infectious mononucleosis like syndrome, Skin pigmentation, Infectious mononucleosis like syndrome
NOT a side effect of dapsone	Nephritis
Isotretinoin	Vitamin A analogue, Used in cystic acne, Bony hyperostosis
MC side effect of prolonged usage of steroids	Affective disorders

ANTIBIOTIC THERAPY

GENERAL FEATURES OF ANTIBIOTIC THERAPY

Antibiotic lock (Dwell therapy) is given in	*Infection associated with vascular access devices*
Common cause of drug to drug interaction	**Antimicrobials**
Bactericidal	Cotrimoxazole
A bactericidal drug is preferred over bacteriostatic drug in	Neutropenia
Tigecycline has been shown to be a bacteriostatic agent against	Escherichia coli
Daptomycin is	Bactericidal
NOT a bactericidal drug	Ethambutol
Bacitracin	Derived from bacteria, acts by inhibiting cell wall synthesis
Drugs acting by inhibiting cell wall synthesis	Cycloserine, Amoxycillin, Bacitracin
Acts by inhibiting cell wall synthesis	Cefepime, Carbapenem, Monobactam, Cephalosporins
Cell wall synthesis is inhibited by	Cycloserine
Fosfomycin acts by inhibiting	Cell wall
Cell wall synthesis is inhibited by	Amoxicillin, penicillin G, Cefotetan
Act by inhibiting cell wall synthesis	Cefepime
Bacitracin acts on	Cell wall
NOT act by inhibiting cell wall synthesis	Nitrofurantoin
Acting on cell membrane	Nystatin, Amphotericin B, Polymyxin B
Inhibiting cell membrane synthesis	Polymyxin
Drugs acting of 30S ribosome	**Tetracycline, aminoglycoside**
Mupirocin	**Pseudomonic acid, inhibits isoleucine tRNA synthetase**
Antibiotic inhibiting protein synthesis by premature chain termination which structurally resembles an aminoacyl tRNA	Puromycin
Antibiotic affecting protein synthesis	Kanamycin, Neomycin, chloramphenicol
Clindamycin	Inhibiting protein synthesis
Act by inhibiting bacterial protein synthesis	Erythromycin
Concentration dependent killing	**Fluoroquinolones, aminoglycosides**
Time dependent killing	**Beta lactams**
Time dependent and prolonged post-antibiotic effect	Clindamycin
Safe in renal failure	Cephalexin, Doxycycline
Useful for anerobic infections	Metronidazole, Imipenem, Aztreonam
Metronidazole is effective against	Amoebiasis, Trichomoniasis, Giardiasis
Metronidazole acts by	*Binding and breaking bacterial DNA*
Spectinomycin is NOT effective in	Gonococcal pharyngitis
Chloroquine is contraindicated in	Psoriasis, Active liver disease
Antimicrobial synergism	Penicillin + streptomycin in SABE, Sulfamethoxazole + trimethoprim in UTI, Amphotericin + flucytosine in cryptococcal meningitis
Mutually antagonistic action	Ampicillin with chloramphenicol
MDR transporter acts by	Causing efflux of drug

Drugs causing disulfiram like reaction	Cefamandole, Metronidazole, Chlorpropamide
Folic acid metabolism inhibited by	Sulfonamides, Methotrexate, Trimethoprim
Folate deficiency occurs in	Phenytoin, Phenobarbitone, Pyrimidone
Mechanism of resistance in Quinopristin/ Dalfopristin/Linezolid	**Metabolism**

BETALACTAMS

Beta lactams act by inhibiting	Cell wall synthesis
Phenomenon shown by beta lactams	**Transpeptidation**
Beta lactam ring is NOT seen in	Vancomycin
Beta lactams safely used in pt with history of allergy to penicillin	Aztreonam
Clavulanic acid	Oral preparation with amoxicillin, parenteral preparation ticarcillin, beta lactamase inhibitors
A potent inhibitor of beta lactamase	Clavulanic acid
ESBL	Ambler classification is based on 3rd generation cephalosporin sensitivity
Extended activity of beta lactamase inactivate	Cephalosporin III generation
ESBL are NOT characterized by activity against	Carbapenems
NOT true about extended spectrum beta lactamase	Carbapenems are sensitive to ESBL
Ventilator associated pneumonia, treatment with ceftriaxone and amikacin, culture found to be ESBL klebsiella	Change to imipenem
A patient in ICU having fever since 1 week. empirical started on cefriaxone and amikacin. pus sent for culture after 48 hours, blood culture showed Klebsiella with ESBL	Change ceftriaxone to imipenem
Imipenem	In renal dysfunction, dose reduction are necessary to avoid seizures
Imipenem	NOT used in penicillin allergy
Cilastatin given along with	Imipenem
Cilastatin is added to imipenem because it	*Decreases the metabolism of imipenem in kidneys*
Development of resistance to beta lactams	*Drug inactivation by beta lactamase, insensitivity of target, active efflux*

PENICILLIN

For commercial production of penicillin extraction is made from	Penicillium chrysogenum
Acts by inhibiting cell wall synthesis	Penicillin
Penicillin	Secreted in tubules
Penicillin G	Active against gram positive organisms, can NOT be given orally, probenecid given along with penicillin G increases its duration of action
Penicillin G is used for	Rat bite fever
Penicillin that can be given intravenously	Penicillin G

Which drug's absorption increased in gastric achlorhydria	Penicillin G
Does NOT undergo hepatic metabolism before excretion	Penicillin G
NOT a therapeutic use of penicillin G	Rickettsial infection
Route of administration of penicillin V	**Oral**
Acid labile and beta lactamase resistant penicillin	Methicillin
Penicillinase resistant penicillin	Methicillin
Acid susceptible penicillin	Methicillin
Amoxicillin is better than ampicillin is due to	Better bioavailability if taken with food
Long action of amoxicillin is due to	Long half life
Safe during pregnancy	Ampicillin
NOT nephrotoxic	Ampicillin
Neutropenia associated with	Nafcillin
NOT a therapeutic use of penicillin	Rickettsial infection
Treatment of Penicillin induced anaphylaxis	Adrenaline
Penicillin effective orally as well parenterally	*Cloxacillin, amoxicillin*
Penicillinase resistant penicillin	Cloxacillin, Methicillin, Ampicillin
NOT penicillinase susceptible	Cloxacillin
NOT a beta lactamase inhibitor	Piperacillin
NOT a beta lactamase resistant penicillin	Carbenicillin
Penicillin develop resistance by	Producing Beta lactamase
Resistance by producing beta lactamase is	*Plasmid mediated*
Pneumococcal resistance to penicillin is mainly acquired by	Transformation
Penicillinase resistance	Beta lactamase production is the most common mechanism of resistance, alteration in permeability or penetration of antibiotic causes resistance only in gram negative bacteria, beta lactamase production cause resistance in both gram positive and gram negative bacteria
Penicillin binding proteins	Essential for cell wall synthesis, act as carboxypeptidases and transpeptidases, alteration in PBP is the primary bases of resistance in MRSA
NOT true about penicillin binding proteins	These are target site for vancomycin

CEPHALOSPORINS

Cephalosporins act by inhibiting	Cell wall synthesis
Oral cephalosporins	**Cefaclor, cefadroxil, cefuroxime axetil, ceftibuten, cefdinir, cefprozil, cefditoren, cefpodoxime**
Oral second generation cephalosporin	Cefaclor
Oral third generation cephalosporin	Cefixime
Advantage of third generation cephalosporins over 2nd generation cephalosporins	Effective against gram negative bacteria
Ceftriaxone is	3rd generation parenteral antibiotic
Ceftriaxone	Third generation long acting cephalosporin
Biliary sludge is associated with	*Ceftriaxone*
Third generation extended spectrum cephalosporin with anti	**Ceftobiprole**

MRSA activity	
NOT true about cefuroxime	Third generation cephalosporin
Fourth generation cephalosporin	Cefepime
Fourth generation cephalosporin	Cefuroxime
NOT true about cefepime	Given twice daily orally
NOT true about cephalosporins	Active only against gram negative bacteria
NOT true about cephalosporins	Cefoxitine has got no activity against anaerobes
NOT true	Cefoxitin has no activity against anerobes
Antibiotic safely used in pregnant woman	Cefuroxime
Cephalosporin that do NOT need dose reduction in any degree of renal impairment	Cefoperazone
Cephalosporin used in patients with low GFR	Cefoperazone

AMINOGLYCOSIDES

Misreading of mRNA code is associated with	Aminoglycosides
NOT true about aminoglycoside	Bacteriostatic
Single dose aminoglycoside is preferred because	Post antibiotic effect
NOT an aminoglycoside	Azithromycin
Enzyme inactivation is the mode of resistance to	Aminoglycoside
Nephrotoxicity seen with	Aminoglycosides
Does NOT increase risk for aminoglycoside renal toxicity	*Simultaneous use of penicillin*
NOT a risk factor for renal toxicity by aminoglycosides	Simultaneous administration of penicillin
Aminoglycoside having highest nephrotoxicity	Neomycin
Aminoglycoside poorly absorbed orally	Neomycin
Inhibiting protein synthesis	Streptomycin
Require dose adjustment in renal failure	Streptomycin
Single dose of streptomycin is more effective than multiple small doses	Concentration dependent lytic effect
An aminoglycoside which is resistant to majority of inactivating enzymes	Amikacin
Aminoglycoside most likely to remain a useful therapeutic agent in the event of streptomycin resistance	Kanamycin
Mechanism of resistance in aminoglycoside	**Inactivation**

LINEZOLID

First oxazolidinone	**Linezolid**
Linezolid	*Binds to 23s ribosomal RNA, active against mycobacterium tuberculosis, no cross resistance with other drug classes*
Linezolid	Oxazolidones
Linezolid is	**Bacteriostatic**
Antibiotic having NON specific MAO inhibitor activity	Linezolid
Linezolid is best for	VRSA
Principal toxicity of linezolid	*Hematologic*

Monitored if linezolid is given for more than 14 days	Platelet count
Side effect of linezolid	**Thrombocytopenia**

MACROLIDE ANTIBIOTICS

Group of antibiotics possessing additional anti-inflammatory and immunomodulatory activities	Macrolides
NOT a macrolide antibiotic	Vancomycin
Erythromycin act by	Translocation of 50S ribosome
Blocking translocation of peptide chain from aminoacyl site to peptidyl site	Erythromycin and clindamycin
Drug interferes with translocation of protein synthesis	Erythromycin
Erythromycin	Interference with translocation, act on motilin receptor
Erythromycin is given in decreased bowel motility because	It binds to motilin receptor
Does NOT require dose alteration in renal failure	Erythromycin
Azithromycin is used as superior drug to erythromycin in	Chlamydial infection of cervix and urethra

GLYCOPEPTIDES ANTIBIOTICS

Glycopeptides antibiotic	Vancomycin
Mechanism of action of vancomycin	Inhibition of cell wall synthesis
Does NOT act by inhibiting protein synthesis	Vancomycin
For which of the following drug, dosage interval should be maximum in a patient with creatinine clearance less than 10	Vancomycin
Dose interval should be maximum in patients with creatinine clearance less than 10	Vancomycin
Redman syndrome	Vancomycin
Recent drug approved for skin and soft tissue infections	**Televancin (derivative of vancomycin)**

CHLORAMPHENICOL

Primarily bacteriostatic drug	Chloramphenicol
Chloramphenicol act though	50S ribosome
Drug which acts by binding to P site in prokaryotes	Chloramphenicol
Red cell aplasia caused by	Chloramphenicol
Grey baby syndrome	Chloramphenicol
Mechanism of resistance in chloramphenicol	**Plasmid encoded enzyme**

SULFONAMIDES

Sulphamethoxazole : trimethoprim	5:1
Sulfonamide	Crystalluria, kernicterus in newborn, for infection due to Nocardia

Drug with antifolate mechanism	Sulfonamides
NOT true about sulfonamide	Sulfasalazine well absorbed from GIT
Long acting sulfonamides	Sulfadoxine, sulfamethopyrazine
Poorly absorbed sulfonamides	Sulfasalazine (active in bowel lumen, administered orally)
Topically used sulfonamides	Sulphacetamide, silver sulfadiazine, mafenide
Eye drops of which sulfonamide used clinically	Sulfacetamide
NOT a topical sulfonamide	Sulfasalazine
Sulphamethiazole Is principally used for	Urinary infection
Contraindicated in patients allergic to sulfonamide	Brinzolamide

TETRACYCLINE DERIVATIVES

Broad spectrum antibiotic	Tetracycline
Tetracycline inhibits protein synthesis by	Binding to 30s subunit and inhibiting the binding of aminoacyl tRNA to A site
Tetracycline	Binds to A site and inhibit attachment of tRNA
Tetracycline	Teratogenic, Tooth discolouration, Superinfection, Can lead to pseudomembranous colitis
Tigecyline is an analogue of	**Minocycline**
NOT a form of tetracycline	Topical in open wound
Tetracycline is used as prophylaxis for	Cholera
NOT an adverse effect of tetracycline in pregnant woman	Gingival hyperplasia
Tetracyclines are NOT useful for	Trichomonas
Teeth discolouration by UV light fluorescence in infant due to	Tetracycline staining
Inhibiting proteins synthesis	Doxycycline
Least nephrotoxic	Doxycycline
Doxycycline NOT used in	Leptospirosis
Mechanism of resistance in tetracycline	**Plasmid encoded efflux pump**

QUINOLONES

Fluoroquinolone	Suspected of having teratogenic potential, arthropathy of limb in children may occur, increase theophylline activity
Fluoroquinolone	Low toxicity to host cells, DNA gyrase inhibitors, effective against pseudomonas
Mechanism of action of fluoroquinolones	Inhibits DNA gyrase
Cifran acts by inhibiting	DNA gyrase (A subunit)
Novobiocin acts by inhibiting	**DNA gyrase (B subunit)**
Mechanism of action of Fluoroquinolones on Gram Positive bacteria	Topoisomerse IV Inhibitor
Elaboration of inactivating enzymes is NOT an important mechanism of action of	Quinolones
Drug resistance due to drug destroying enzymes NOT seen in	Quinolones
Blocks replication without getting involved in DNA	Nalidixic acid, Ciprofloxacin

strand	
Longest half life	Grepafloxacin
Cartilage damage in children	Ciprofloxacin
Quinolone with highest CSF penetrating power	Pefloxacin
Fluoroquinolone safe in renal failure	Trovafloxacin, Pefloxacin, Moxifloxacin
Fluoroquinolone does NOT need dose reduction in increased creatinine	Trovafloxacin
Concomitant administration of drug enhances CNS effect of Ciprofloxacin	Aspirin
Sparfloxacin and astemizole can cause	Ventricular arrhythmia
Sparfloxacin and terfenadine can cause	Ventricular arrhythmia
Mechanism of resistance in quinolones	**Mutation in target**

ANTIFUNGAL DRUGS

Antifungal with high affinity for keratin	Griseofulvin
Absorption of drug increases with food intake	Griseofulvin
Antimicrobial NOT used topically	Griseofulvin
Does NOT act on cell membrane	Griseofulvin
NOT used for systemic fungal infection	Griseofulvin
Mechanism of action of terbinafine	Inhibition of ergosterol synthesis
Antifungal having only topical action	Clotrimazole
Clotrimazole	Topical antifungal
Oral antifungal agent	Ketoconazole
Broad spectrum antifungal	Ketoconazole
Treat both dermatophytosis and candidial infection	Ketoconazole
Inhibits ergosterol biosynthesis	Ketoconazole
Antifungal drug used for systemic use in children	*Fluconazole*
Action of dapsone is antagonized by	Erythromycin
Dapsone NOT used for	TB
Antimetabolite acting as antifungal agent	5-flucytosine
Amphotericin B obtained from	Streptomyces nodosus
Antimicrobial drug inhibiting ergosterol biosynthesis	Amphotericin B
Induction of treatment in serious fungal infection is mostly done by	IV amphotericin B
Postoperative fungal infection of brain treated with	Amphotericin B
Liposomal amphotericin B	Less nephrotoxicity
Amphotericin B causes	Hypokalemia
Renal damage due to amphotericin B	Azotemia , Renal tubular acidosis, Hypokalemia
Amphotericin B cause deficiency	Potassium
NOT true about ciclopirox	Ciclopirox olamine is effective in systemic mycosis
NOT an antifungal agent	Clofazimine

ANTIVIRAL DRUGS

Adefovir	Acyclic nucleotide analogue, Well tolerated orally, Used in ART

Antiviral drug having dual activity against HIV and HBV	Adefovir
NOT true regarding adefovir	Used in chronic hepatitis C infection
Lamivudine	Dose higher for HIV than HBV, NOT used as monotherapy
Cidofovir used in	Respiratory papillamatosis
Cidofovir is derived from	**Cytosine**
Cidofovir is approved for	**CMV retinitis if intolerant to gancicyclovir/foscarnet**
Telbiviridine	**Derived from thymidine**

ANTIPROTOZOAL DRUGS

Chloroquine is given in high loading dose because of	High volume of distribution
Volume of distribution of chloroquine	Above 1300 ml
Chloroquine given as 600 mg loading dose because	Increased tissue binding
Only available oral drug for Ectoparasites	Ivermectin
Chloroquine useful in	DLE, RA, Infectious monocucleosus
Safely given in pregnancy	Chloroquine
Drug deposited in retina	Chloroquine
Less hepatotoxic	*Chloroquine*
NOT a complication of chloroquine	Cataract
IV quinine causing restlessness, cause is	Hypoglycemia

ANTI HELMINTHIC DRUGS

Broad spectum antihelminthics	Albendazole, Mebendazole
Effective drug for trematodes and many cestodes	Praziquantel
Antihelminthic safe in pregnancy but contraindicated in renal failure and epilepsy	Piperazine citrate
Antihelminthic acts by producing flaccid paralysis of worm	Piperazine
Ivermectin is used in treatment of	Filariasis, Cutaneous larva migrans, strongyloidosis
Ivermectin is used in treatment of	Ascariasis, Malaria, Oncocerchiasis
Albendazole is inferior to mebendazole in	Trichuris trichura
Mebendazole NOT used in	Strongyloidosis
Mebandazole can NOT be used for	Onchocerciasis
Albendazole is NOT used for	Schistosomiasis

ANTICANCER DRUGS

GENERAL FEATURES OF ANTICANCER DRUGS

Cells most susceptible to chemotherapy induced myelosuppression	*Neutrophils*
Alkylating agents	Produce highly reactive carbonium ion intermediates, cell cycle non specific

Alkylating agents	Nitrogen mustards, nitrosoureas, busulfan, dacarbazone, thio tepa, platinum analogues
Prototype of nitrogen mustard	**Mechlorethamine**
Alkylating agents	Chlorambucil, Cyclophosphamide
Alkylating agents	Busulfan, Cisplatin, Procarbazine
NOT an alkylating agent	Zalcitabine
Cell cycle specific anticancer drug	Bleomycin, Vinblastine
Cell cycle specific anticancer drug	*Methotrexate*
Proliferation independent means	Cell cycle non specific
S phase specific	Methotrexate, Hydroxyurea, Thioguanine
NOT S phase specific	Ifosfamide
Anticancer antibiotics	Actinomycin, Bleomycin, Mithromycin
Anticancer drugs of plant origin	Vincristine, Isotretinoin
Drugs having antineoplastic properties	Retinoids
Metaphase arrest is caused by	Vincristine, Paclitaxel, Colchicines
Enzyme used as anti cancer drug	L asparaginase
Antimetabolite undergoing biotransformation to form an indicator of DNA polymerase	Cytosine arabinoside
Chemotherapeutic agent commonly administered by continuous infusion	Ara C
Anticancer drug act by hypomethylation	Decitabine
Anticancer drug having anticholinesterase activity	*Irinotecan*
Function of topoisomerase I	*Reversible single stranded breaks in DNA during DNA replication*
Topoisomerase I inhibitor	Irinotecan
Active form of irinotecan	*SN38*
Cetuximab used in	Palliation of head and neck cancer
Acts by inhibiting tyrosine kinase and activated by EGF receptor as well as HER2	Lapatinib
Erolotinib	Used in non small cell lung carcinoma, Small molecule tyrosine kinase inhibitor acting as EGFR antagonist, Food increases absorption, Causes skin rash and diarrhea
Least nauseating	Chlormabucil
Anticancer agent NOT causing bone marrow suppression	Flutamide
Combination chemotherapy is NOT indicated in	Immunosuppressed patients
Resistant to chemotherapy	Lymphoma, Germ cell tumour, Leukemia
Chemoresistant	Malignant melanoma
Most chemoresistant tumour among following	Malignant fibrous histiocytoma
MC dose limiting toxicity of cancer chemotherapy	Bone marrow suppression
MC side effect of chemotherapy	Nausea
Sterility is caused by	Alkylating agents
Radioprotective	Amifostine
Amifostine NOT protective to	CNS
Toxicity of nitrogen mustards can be decreased by	GM-CSF
Pulmonary fibrosis caused by	Bleomycin, Nitrofurantoin
Poor wound healing is seen in	Nitrogen mustard
Anticancer drug causing hypercoagulable state	L-asparaginase

Anticancer drug crossing blood brain barrier	Nitrosoureas
Cerebellar toxicity is seen with	Cytarabine
Hand and foot syndrome is a side effect of	Capecitabine
Sustained neutropenia is an adverse effect of	Carmustine
Accentuate antimetabolite action	*Etoposide*
Chemocaps can decrease alopecia by	**Decreasing temperature**
Vaccine contraindicated in patients receiving chemotherapy	**VZV**
Sensitive measure of lung toxicity by chemotherapeutic agent	**DLCO**

METHOTREXATE

Methotrexate is an	Antimetabolite
Methotrexate	Inhibit dihydrofolate reductase, non proliferative cells are resistant to methotrexate, treatment of psoriasis
Methotrexate causes	*Thymine less death*
Hepatic fibrosis is associated with	*Methotrexate*
NOT true about methotrexate	Folinic acid enhances action of methotrexate
NOT a use of methotrexate	Sickle cell anemia
Methotrexate resistance occurs by	Overproduction of DHFR
Parameter in methotrexate therapy	Liver function test, PFT, Hemogram
Alkalinisation of urine ameliorates the toxicity of	Methotrexate
NOT an early adverse effect of methotrexate	Hepatic fibrosis
Prevention of Premetrexed toxicity	Folic acid+ vitamin B12
Leucovorin is used to decrease toxicity of	Methotrexate
Methotrexate given with	Folinic acid

CYCLOPHOSPHAMIDE AND IFOSFAMIDE

Cyclophosphamide	Alkylating agent
NOT true regarding cyclophosphamide	Orally ineffective
Hemorrhagic cystitis caused by	Cyclophosphamide
Sterile hemorrhagic cystitis is associated with	Cyclophosphamide
Mesna is given with cyclophosphamide to	Ameliorate hemorrhagic cystitis
Given orally	Mesna
Mesna	3 times a day, mercaptoethanesulfonate
Ifofamide	More neurotoxic than cyclophosphamide
Ifosfamide	Alkylating agent
Ifosfamide	Metabolized by cytochorme p450, Chloracetadehyde is the metabolite, Nitrogen mustard
Active form of ifosfamide	Chloracetaldehyde
NOT true about ifosfamide	Less neurotoxic than cylophosphamide

5-FLUOROURACIL

Antimetabolite	5 fluorouracil
NOT an alkylating agent	5 Fluorouracil

5-FU NOT useful in	Ca pancreas
Common side effect of 5 fluorouracil	GI toxicity
Anticancer drug excreted by lungs	5- fluorouracil
Reversible posterior leukoencephalopathy is associated with	*5-fluorouracil*

BLEOMYCIN

Antineoplastic drug is a peptide	Bleomycin
Antitumour peptide	Bleomycin
Pulmonary fibrosis seen with	Bleomycin
Bleomycin toxicity is associated with	Destruction of type I pneumocytes and hyperplasia/dysplasia of type II pneumocytes
Bleomycin toxicity affects	Type II pneumocyte
Bleomycin toxicity is characterized by destruction of	Type I pneumocytes

VINCRISTINE AND VINBLASTINE

Vincistine	Alkaloid, Neurotoxicity, Alopecia, Useful drug for induction of remission in ALL
Drug binding with tubulin and arrests cell cycle in metaphase	Vinca alkaloids
Alkaloids used as anticancer agent	Vincristine
Vincristine arrests cell cycle at	Metaphase
Drug acting on mitotic phase of cell cycle	Vincristine
Spindle poison	Vincristine
Cell cycle specific	Vincristine
Anticancer drug causing peripheral neuritis	Vincristine
Side effects of vinca alkaloids	**Stocking glove neuropathy**
Does NOT cause myelosuppression	Vincristine
Vinblastine	**Vesicant**

PACLITAXEL

Mechanism of action of paclitaxel	Increased polymerization of tubules
Paclitaxel	Stabilization of tubules
Stock and glove neuropathy	Paclitaxel
Adverse effects of paclitaxel	Nephrotoxicity
Side effect of docletaxel	**Fluid retention syndrome**

ACTINOMYCIN D

Mode of action of actinomycin D is to prevent	RNA elongation
Requiring dose adjustment in the patient during radiotherapy in order to prevent radiation toxicity	Dactinomycin
Radiation recall phenomenon	Actinomycin D

6-MERCAPTOPURINE

Sodium 2 mercaptethane sulfonate in used as a protective agent in	Cancer chemotherapy
Patient receiving allopurinol require dose reduction of	6 mercaptopurine

DOXORUBICIN

Most common drug for trans arterial chemoembolization	*Doxorubicin*
Antineoplastic drug best avoided in cardiovascular problems	Anthracycline
Radiation recall phenomenon	Doxorubicin
Cardiotoxic drug	Adriamycin
Cardiotoxicity is seen with	Doxorubicin
Helps in reducing toxicity of doxorubicin to heart	Dexrazoxane

CISPLATIN

Antineoplastic drug NOT acting at cell cycle level	Cisplatin
Common side effect of cisplatin	Vomiting
Most emetogenic anti cancer drug	Cisplatin
Drug associated with untoward side effect of renal tubular damage	Cisplatin
Drug producing significant nephrotoxicity	Cisplatin
Side effect of cisplatin	*Hypomagnesemia*
Hand foot syndrome is associated with	Cisplatin
NOT a cardiotoxic drug	Cisplatin
Important mechanism of cisplatin resistance	*Increased glutathione*

AUTONOMOUS NERVOUS SYSTEM

GENERAL FEATURES OF AUTONOMIC NERVOUS SYSTEM

Autonomic nervous system	Superior hypogastric plexus is located at the anterior aspect of aortic bifurcation and fifth lumbar vertebra
Sympathetic stimulation is associated with	**Increased BP and heart rate, decreased bowel movements, bronchodilatation, pupillary dilatation, ejaculation, sweating**
Vasoconstriction is sympathetically stimulated EXCEPT in	*Coronary artery*
Glandular secretion is	*Sweat glands*

parasympathetically stimulated EXCEPT in	
MC cause of autonomic storm	**Blunt injury**
Covalent drug receptor interaction	Phenoxybenzamine binding to alpha adrenergic receptor
Methyldopa acts on	Alpha 2
Clonidine used for	Migraine, Opioid withdrawal syndrome, To decrease anesthetic requirement
NOT true about clonidine	Can produce CNS stimulation
Depression may be a side effect of	Reserpine
Binds only with anionic site of cholinesterase	Edrophonium
Enzyme involved in Acetylcholine synthesis	Choline acetyl transferase
Acts commonly both on parasympathetic and sympathetic division	Acetylcholine
Spontaneous release of acetylcholine at the neuromuscular junction produce	Miniature end plate potential
Loss of acetylcholine receptors in slow channel syndrome is due to accumulation of	Calcium ion
Mechanism of vasodilatation of acetylcholine	Inhibition of norepinephrine release from adrenergic nerve ending, Stimulation of M3 receptors located on endothelial cells
How a drug would competes with Ach for receptors at motor end plant affect skeletal muscle. It would	Causes muscle to relax and unable to contract
Acetylcholine through nicotinic receptors cause	Contraction of Skeletal muscle
Ach mediated vasodilatation is	*Endothelin dependent*
Therapeutic use of acetylcholine is NOT possible because it is	Rapidly degraded
Acetylcholine NOT used commercially because	Rapidly destroyed in body
Hexamethonium	Sympathetic blocker, Parasympathetic blocker, Nicotinic blocker
Na+ or K+ are involved in mechanism of action of	Nm,Nn,5-HT3,dopamine
Mechanism of action of donepezil	Centrally acting reversible anticholinesterase
NOT a catecholamine	Phenylephrine
Drug NOT acting on dopaminergic receptor	Dobutamine
Dale's vasomotor reversal	Stimulation of beta 2 receptors

CHOLINERGIC DRUGS

M1 stimulant	*Oxtremorine*
M2 stimulant	*Methacholine*
M3 stimulant	*Bethanechol, pilocarpine, cevimeline*
Sympathetic vasodilatory fibres act through	*M3*
Secretion of epinephrine by adrenal medulla	*Cholinergic nicotinic*
Synaptic transmission in autonomic ganglion is	Cholinergic
Parasympathetic stimulation decrease	SA node rhythmicity, heart rate, atrial contractility
Which of the following is not a use of cholinomimetic	Bradycardia
Cholinomimetics is contraindicated in	Parial heart block, bradycardia

NOT a cholinergic agent	Memantine
Hemicholinium	Prevents release of Ach from storage vesicles
Vesamicol	Inhibits uptake of choline
Use of methacholine	To diagnose bronchial hyperactivity
Neostigmine	Quarternary ammonium compound, Possess agonistic action of Nm receptors
Neostigmine antagonize non depolarizing blockade by	Decreasing breakdown of acetylcholine at motor end plate, preventing K efflux from cell, depolarization of motor end plate
Drug increasing gastrointestinal motility	Neostigmine
A patient complains of muscle weakness. It was reversed on administration of neostigmine, because	Interferes with action of acetylcholine esterase
Drug NOT having atropine like action	Neostigmine
Drug does NOT crossing blood brain barrier	Neostigmine
Neostigmine NOT able to cross blood brain barrier because of its	Quarternary structure
NOT true about neostigmine	Shorter acting than edrophonium
NOT an action of neostigmine	Preventing K+ efflux from cell
Drug crossing blood brain barrier	Physostigmine
Anticholinesterase effective on CNS	Physostigmine
Naturally occurring anticholinesterase	Physostigmine
Antidote for belladona poisoning	Physostigmine
Anticholinesterase active on CNS	Physostigmine
Drug used to counter anticholinergic effect	Physostigmine
Physostigmine and bethanechol in small doses have significantly different effects on	Neuromuscular junction
Shortest acting acetycholinesterase inhibitor	Edrophonium
NOT a reversible anticholinesterase	Echothiophate

ANTICHOLINERGIC DRUGS

M1 blocker	*Pirenzepine, telenzepine*
M3 antagonist	*Hexahydrosilodifenidol*
NOT an anticholinergic	Amphetamine
NOT an indication of anticholinergic	Glaucoma
NOT an action of muscarinic antagonist	Prolongs AV conduction
NOT an action of muscarinic antagonist	Contract radial muscles of iris
Use of tiotropium is contraindicated in	Urinary retention
NOT used in treatment of urinary incontinence	Iptratropium
NOT true of ipratropium bromide	Increased intraocular pressure
Oxybutynin acts by	Muscarinic receptor inhibition
Advantage of Glycopyrrolate over Atropine	Less CNS actions
Does NOT produce central anticholinergic syndrome	Glycopyrrolate
Pirenzepine acts on	Muscarinic receptor
Selective antagonistic of M1 receptor	Pirenzepine
Hyoscine differs from Atropine because it causes	Drowsiness
Useful in prophylaxis of motion sickness	Hyoscine
Narcoanalysis	Scopolamine
Treatment of death rattle	**Scopolamine**

NOT true about atropine	Bronchoconstrictor
Atropine results in stimulation of	Medullary and higher centres
Atropine is used with Neostigmine to reverse	Muscarinic effects of Acetylcholine
Atropine is given with neostigmine to prevent	Bradycardia
Atropine should never be started in cyanosed patient due to danger of	Respiratory arrest
If an anaesthetic is using atropine should remember	Tachycardia is produced
Atropine induced tachycardia is due to	Muscarinic blockade
Main mechanism of hyperpyrexia induced by atropine includes	Inhibition of sweating
Atropine is used in organophosphorus poisoning because it	Competitive antagonist of acetylcholine
NOT an action of atropine	Bronchoconstriction
Atropine does NOT block muscarinic effects of	Carbachol
Atropine is NOT used for	Glaucoma
Atropine can cause	Heart block, Hypertension
Atropine does NOT cause	Increased bowel sounds
Atropine does NOT cause	Excessive salivation
Treatment of atropine toxicity	Physostigmine

ADRENERGIC DRUGS

Sympathetic stimulation decrease blood supply to	Skin
Catecholamine action of alpha receptor causes	Gastrointestinal sphincter contraction
Adrenergic receptors	Alpha 2 receptors presynaptic, Noradrenaline stimulates beta 1 receptors in heart, Alpha 2 receptor stimulation inhibits transmitter release
Alpha 1 adrenergic mediated through	Calcium
Alpha 1 agonist	*Oxymetazoline, phenylephrine, mephentermine*
Alpha 2 agonist	*Clonidine, methyldopa, guanafacine, apraclonidine, rilmedine, dexmedetomidine*
NOT an alpha adrenergic agonist	Ritodrine
NOT an alpha agonist	Pseudoephedrine
NOT an alpha adrenoceptor agonist	Methydopa
NOT an alpha agonist	Methyl dopa (prodrug)
NOT an use of alpha 2 agonist	BPH, Ischemia
Not done by alpha 2 agonist	Hyperalgesia
True about beta receptors	Beta 1 receptors in heart stimulate its contractions, Beta receptors are present in smooth muscles
NOT mediated through beta 2 receptors	Stimulation of lipolysis
Tachyphylaxis	Indirect sympathomimetics involved
Tachyphylaxis is associated with	*Tyramine*
Indirect sympathomimetics are involved in	*Tyramine*
Increases systolic and diastolic BP for prolonged period	Ephedrine
Non catecholamine sympathomimetic drug	Ephedrine
Mephentermine acts by	Increasing cardiac output, Increased both systolic and

	diastolic BP
During surgery patient had sudden hypotension. Can be used to increase blood pressure	Mephentermine
Orally active prodrug partial alpha 1 agonist useful in autonomic instability and postural hypotension	Midodrine
A patient who is using a direct acting sympathomimetic agent as a decongestant is most likely to be taking	*Phenylephrine*
Drug containing both alpha and beta agonist activity	Epinephrine
Dose of Adrenaline in a neonate	1/100 mg/kg
Dosage of adrenaline	1 in 10,000
Adrenaline	1 in 100 for inhalation, 1 in 10,000 for intravenous route, 1 in 1000 for sc and im
Epinephrine acts by stimulating	Adenyl cylase
Exogenous adrenaline is metabolized by	COMT
Metabolite of epinephrine	Metanephrine, Homovanilic acid
Direct action of Adrenaline	Tachycardia
Biphasic reaction on blood pressure in seen with administration of	Adrenaline
IV adrenaline	Increases pulse pressure, Increases systolic BP, decreases diastolic BP and causes tachycardia
Most potent cardiac stimulant	Adrenaline
Muscle glycolysis is increased by	Epinephrine
Epinephrine cause hyperglycemia by	Increased glucagon
Epinephrine is most useful in	Anaphylactic shock
Use of adrenaline in anaphylactic shock	Usual dose is 0.5 – 1 mg by IM route
Epinephrine in shock given by	IM
Adrenaline does NOT increase	Diastolic BP
Neurotransmitter released at end organ effectors of sympathetic division of autonomic nervous system	Noradrenaline
Rate limiting step of norepinephrine synthesis	Conversion of tyrosine to DOPA
Therapeutic levels of Norepinephrine	50 – 150 mg/dl
Shortest half life	Norepinephrine
Major metabolite of noradrenaline in urine	VMA
Conversion of norepinephrine to epinephrine occurs by	Methylation
Norepinephrine act by decreasing cAMP concentration in	Alpha 2
Norepinephrine action at synaptic cleft is teminated by	Reuptake
IV noradrenaline	Increases both systolic and diastolic BP and causes bradycardia
Noradrenaline acts on all receptors except	*Beta 2*
IV norepinephrine in intact animal	*Increases BP, decreases heart rate*
Norepinephrine causes	Bradycardia
Dopamine	Decreases peripheral resistance, improves renal perfusion
Drug increasing renal blood flow	Dopamine
Dopamine	Vasodilatation, inotropic agent, local excavation causes tissue Necrosis
Dopamine	Increases peripheral resistance and improves renal function

Dopamine causes positive inotropic effect by acting of	*Beta 1 adrenergic receptor*
Selective dopamine receptor 1 weak partial agonist	Fenoldopam
Effect of dopamine on kidney is blocked by	Phentolamine
Dopamine beta hydroxylase catalyses	Dopamine to norepinephrine
NOT an action of dopamine	Decreased peripheral resistance
Renal dose of dopamine	1-2 microgram per kg per minute
Dopamine at dose of 5-10 mg/kg/min acts on	Beta1 receptors
Dopamine is preferred in treatment of shock because of	Renal vasodilatory action
NOT an endogenous catecholamine	Dobutamine
Beta 1 selective agonist	Dobutamine
Dobutamine	Alpha receptor agonism, beta adrenergic agonism, increasing force of contraction
Dobutamine	Strong vasoconstrictor
Dobutamine preferred over dopamine because of	Less arrhythmogenic potential, Less renal vasodilatation, Less coronary vasoconstriction
Dobutamine increases	Cardiac output
Dobutamine causes	Decrease in peripheral resistance
Half life of dobutamine	120 seconds
NOT true about dobutamine	Agonist of D1 and D2 receptors
NOT an endogenous catecholamine	Isoprenaline
IV isoporerenol	Increases systolic BP, decreases diastolic BP and causes tachycardia
Vasodilator effect of isoproterenol can be abolished by	Propanolol
Non catecholamine acting selectively on beta receptor	*Prenalterenol*

ADRENERGIC BLOCKING AGENTS

Non selective irreversible alpha blocker	*Phenoxybenzamine*
Non selective reversible alpha blocker	*Phentolamine, tolazolin*
Adrenergic neuron blocking drug	Reserpine, Guanethidine, Bretylium
Alpha as well as beta blocker	Labetalol
Intrinsic activity is associated with	*Labetalol*
Combined alpha and beta blocker	Labetalol, Carvedilol
Vasomotor reversal of Dale due to	Alpha blocker
Prazosin used in	PVD, Pheochromocytoma, Scorpion sting
Adrenergic effects antagonized by Prazosin not by Propanolol	Bronchodilatation, Intestinal relaxation, Increased heart rate
Alpha blocker associated with hypotension	Prazosin
Selective alpha1 blocker	Tamsulosin
Tamsulosin	Competitive alpha 1 A antagonist
Phenoxybenzamine	*Alpha 1 antagonist*
Relatively selective alpha 2 blocker with short duration of action	Yohimbine
Selective alpha 2 blocker	Yohimbine
Idazoxan is	Alpha 2 blocker
NOT an alpha adrenergic blocker	Clonidine
Beta blockers	Cause postural hypotension

NOT true about beta blocker	Carvedilol has alpha 1 agonistic and selective beta 1 blocking action
NOT a beta blocker	Salmeterol
Beta blocker NOT indicated in	Hypothyroidism
Contraindications of beta blocker	Asthma , Heart block
Old patient taking beta blocker is prone to develop	Asthma, CHF, Bradycardia
Adverse effects of beta blockers	CHF, Blunting of sympathetic response of oral, hypoglycemic, Bronchial asthma
NOT an adverse effect of beta blocker	Rebound tachycardia
Beta blocker is NOT indicated in	*Parkinsonian tremor*
NOT used for treatment of beta blocker induced excessive bradycardia	Dobutamine
Beta blocker that can be used in renal failure	Propanolol, Pindolol, Oxprenolol
Non selective beta blocker with additional action	Carvedilol, Cartelol, Labetalol
NOT a selective beta 1 blocker	Labetalol
NOT a selective beta blocker	Celiprolol
Cardioselective beta blocker	Atenolol, Esmolol, Acebutolol
Properties making cardioselective beta blockers desirable	Less bronchoconstriction, Less adverse effect on lipid profile, Less likely to cause glucose intolerance, May be used in Raynaud disease, Less liable to impair exercise capacity
NOT a cardioselective beta blocker	Pindolol
NOT a cardioselective beta blocker	Celiprolol
Membrane stabilizing beta blocker	Propanolol
Drug reducing blood pressure primarily by directly decreasing heart rate alone	Propanolol
Heart rate decreased by	Propanolol
Propanolol NOT used in	Parkinsonian tremor
Beta blocker with antioxidant property	Carvedilol
Carvedilol	Antioxidant
Carvedilol	Additional alpha blocking property
Beta blocker with peripheral vasodilator action	Carvedilol
Intrinsic sympathomimetic activity	Pindolol
Pindolol increases heart rate but on addition of a stimulant reduces heart rate as it is a	Partial agonist
Beta blockers with partial agonistic activity	**Acebutolol, labetalol, pindolol**
Esmolol	Short acting beta blocker, Cause bradycardia, No intrinsic sympathomimetic activity, Cardioselective beta blocker, Can precipitate heart failure, Negative ionotropic activity
An ultrashort acting beta blocker devoid of partial agonistic or membrane stabilizing action	Esmolol
Ultrashort acting Betablocker used for anaesthesia	Esmolol
Shortest plasma half life	Esmolol
Short elimination of half life (8-10 min) of esmolol is due to	Hydrolysis by blood esterase
NOT true about esmolol	Esmolol is mainly metabolized in liver
Beta blockers with intrinsic sympathomimetic activity	Oxprenol
Beta blocker with local anesthetic effect	Timolol
Timolol is contraindicated in	COPD
Side effects of timolol maleate	Asthma , Depression, Hypotension

β1 blocker with weak additional β2 agonist	Celiprolol
Beta blocker that can be safely used in asthmatics	*Celiprolol*
Beta1 selective adrenergic blocker	Atenolol
Selective beta1 agonist without intrinsic sympathomimetic property	Propanolol
Most cardioselective beta blocker	*Nebivolol*
Beta blocker with vasodilatory property	*Nebivolol*
Beta blocker with K+ blocking property	*Sotalol*
Beta blocker with K+ opening property	*Tilsolol*
Selective beta 2 antagonist	Butoxamine
Treatment of beta blocker poisoning	**Glucagon**